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INSTALLATION RESTORATION PROGRAM

FURTHER ACTION DECISION DOCUMENT FOR SITE 1 FINAL



MICHIGAN AIR NATIONAL GUARD
110th FIGHTER GROUP
BATTLE CREEK, MICHIGAN

October 1997

Air National Guard
Andrews AFB, Maryland

19971203 165

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ACRONYM LIST

| | |
|-------|---|
| ARARs | Applicable or Relevant and Appropriate Requirements |
| ANGRC | Air National Guard Readiness Center |
| COCs | chemicals of concern |
| DOD | Department of Defense |
| FS | Feasibility Study |
| GSi | Groundwater/Surface Water Interface |
| IRP | Installation Restoration Program |
| MDEQ | Michigan Department of Environmental Quality |
| MERA | Michigan Environmental Response Act |
| MIANG | Michigan Air National Guard |
| PA | Preliminary Assessment |
| PCE | tetrachloroethene |
| PP | Priority Pollutant |
| RAOs | remedial action objectives |
| RI | remedial investigation |
| SI | site investigation |
| SVOCs | semi-volatile organic compounds |
| VOCs | volatile organic compounds |

1.0 INTRODUCTION

This decision document presents the rationale for the proposed remedial action alternative for the Michigan Air National Guard's (MIANG's) W.K. Kellogg Memorial Airport Site 1 in Battle Creek, Michigan. The draft final decision document was reviewed by the Michigan Department of Environmental Quality (MDEQ) and the MDEQ September 4, 1997 letter agreeing with the proposed action is provided in Appendix A. This document is part of the U.S. Department of Defense's (DOD's) Installation Restoration Program (IRP).

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2.0 BASE/SITE DESCRIPTION AND HISTORY

The MIANG base is located in south-central Michigan at the W. K. Kellogg Memorial Airport in Battle Creek, Michigan (Figure 1). The base occupies 315 acres in the northwestern portion of the airport. The Grand Trunk Western Railroad divides the base into two sections; the western portion is approximately 204 acres and the eastern portion is approximately 111 acres.

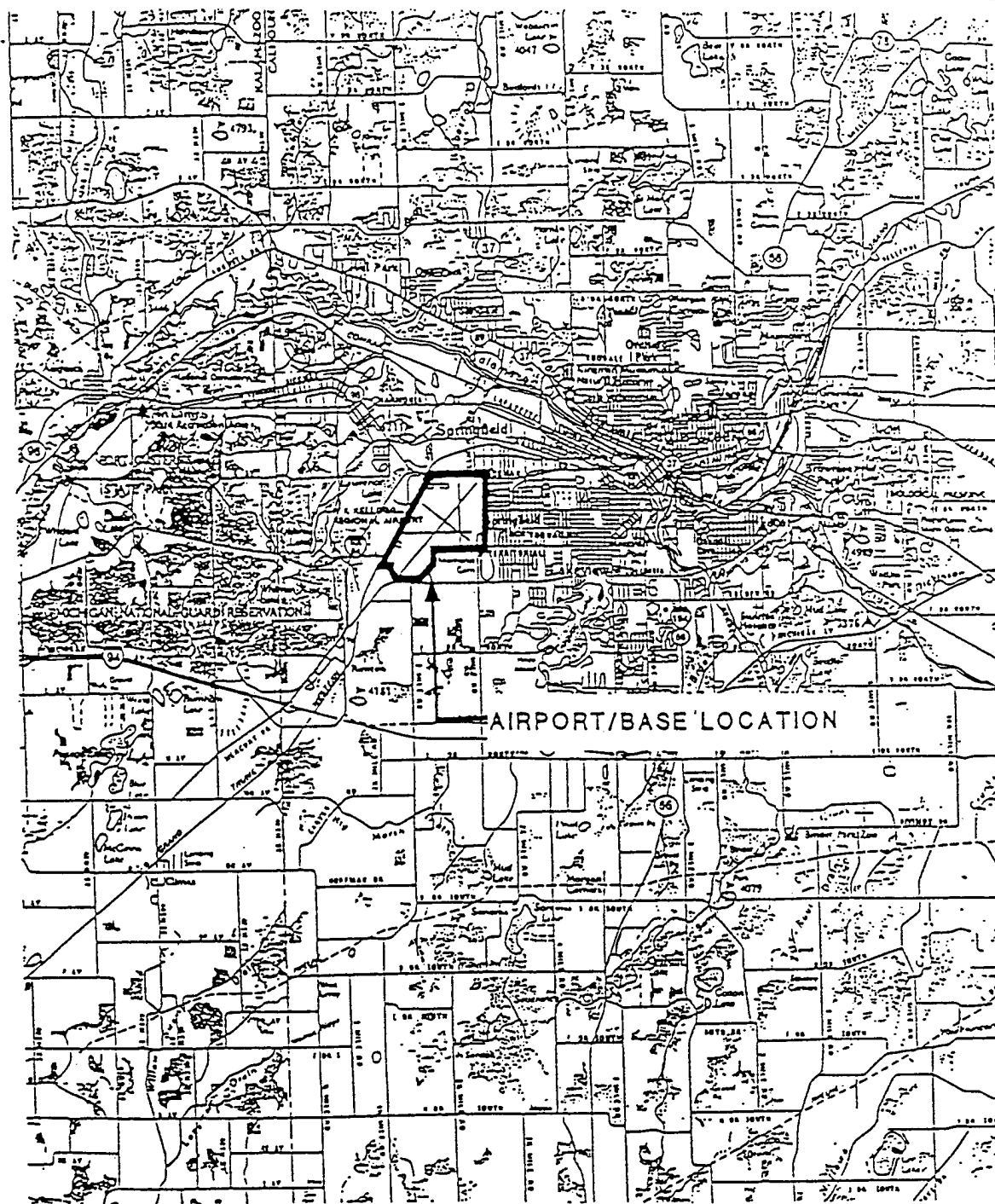
Prior to 1924, the property on which the base is located was used for agricultural purposes. In September 1924, a lease with an option to buy was signed by the Battle Creek Chamber of Commerce. Four years later, W.K. Kellogg donated the necessary money to purchase and make improvements to the site for use as an airport. The Army Air Corps used the airport for combat duty training and to stage crews for overseas deployment from 1942 to 1946. During this time, new runways were constructed and existing runways were lengthened. Buildings were also erected to house base personnel and to support military functions.

In 1946 the Army Air Corps ceased using the airport, the 172nd Fighter Squadron of the MIANG was formed, and Kellogg Field was designated as its headquarters. In 1951, the unit was called to active duty as part of the 56th Fighter Wing at Selfridge Air Force base in Michigan. The unit was redesignated as the 172nd Fighter Bomber Squadron when it returned to Kellogg the following year. In 1955, the unit was reorganized as the 172nd Fighter Interceptor Squadron and was upgraded to the 110th Fighter Group in 1956. This unit was deactivated and redesignated the 172nd Tactical Reconnaissance Squadron in 1958. In 1962, the 172nd Tactical Reconnaissance Squadron became the 110th Tactical Reconnaissance Group. This unit was replaced by the 110th Tactical Air Support Group in 1971. In 1986, the area that the base occupied was increased from approximately 90 acres to 315 acres. In 1992, the unit was reorganized as the 110th Fighter Group and assigned the A-10 aircraft which it currently operates. Throughout its history, the base has stored and used various types of potentially hazardous materials in support of its primary fighter mission.

Site 1 was originally identified as an area that had contained four 25,000-gallon aboveground fuel storage tanks surrounded by containment berms. The storage tanks were dismantled and removed from the base in 1988. The foundations for the tanks still remain at the site. Prior to 1949, the tanks were used for storage of gasoline. The tanks were not used between 1949 and 1973. From 1973 to 1974, the city of Battle Creek used the tanks for the storage of No. 4 heating fuel. The tanks were patched prior to use by the city. Leakage reportedly occurred at some of the patches. The containment berms were spread on the surrounding area in 1985.

The motor pool drainage ditch (formerly Area of Concern B) was later combined with Site 1. This area bordered Site 1 on the east side. The ditch has directed runoff from the motor pool to the drainage swale since 1963. During this time, routine vehicle maintenance activities occurred at the motor pool for approximately 100 vehicles. The motor pool is equipped with an oil/water separator through which the runoff was passed prior to discharge to the motor pool drainage ditch.

Site 1 is located near the drainage swale, northwest of the motor pool parking lot. The features of Site 1 are shown on Figure 2.



MICHIGAN

0 2.5 5
SCALE IN MILES



NOTE

BASE MAP DEVELOPED FROM THE
MICHIGAN ATLAS AND GAZETTEER
PAGE 29, FOURTH EDITION
SECOND PRINTING.

MICHIGAN AIR NATIONAL GUARD
110th FIGHTER GROUP
BATTLE CREEK, MICHIGAN

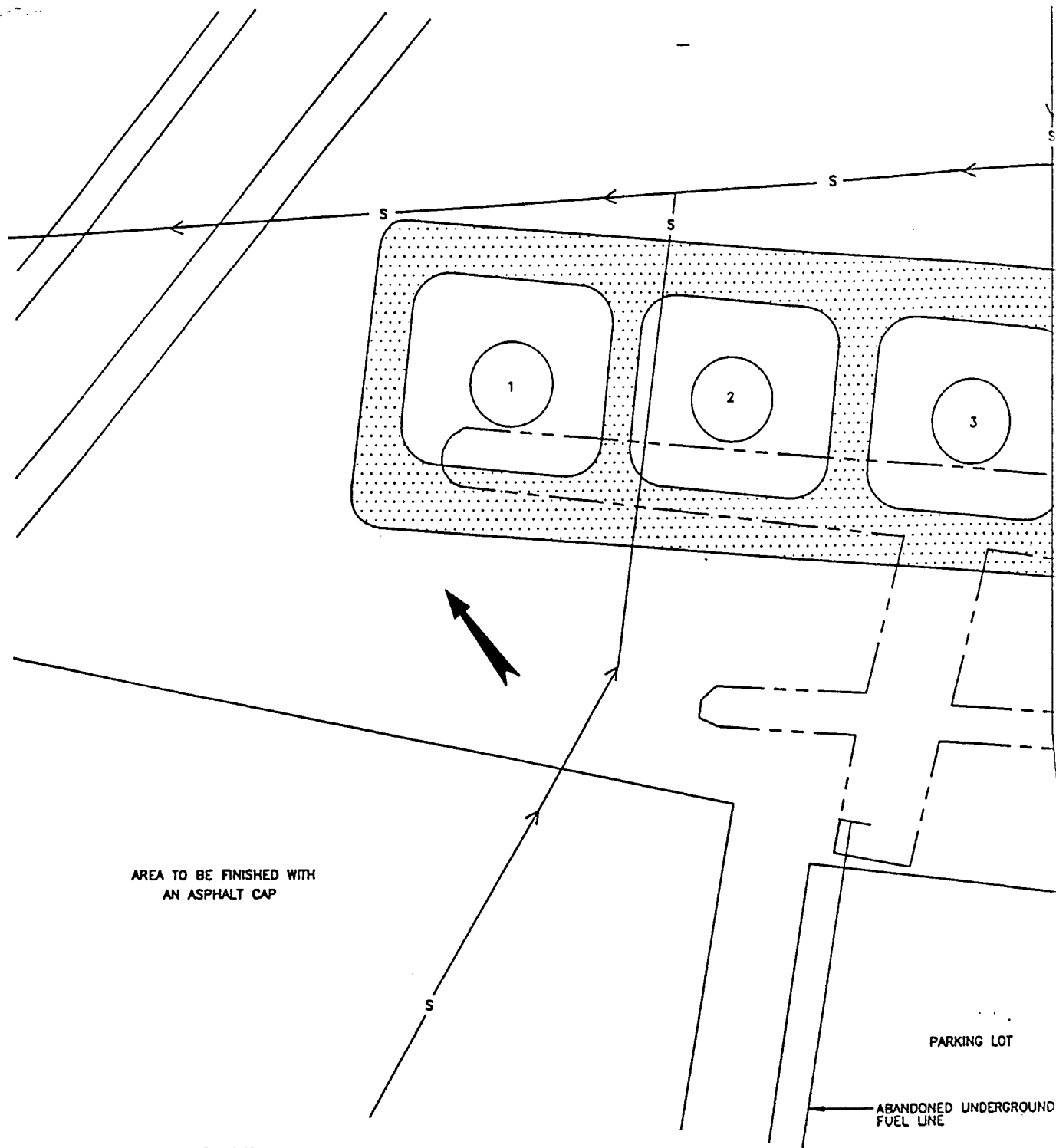
GENERAL LOCATION MAP

FIGURE 1



MONTGOMERY WATSON

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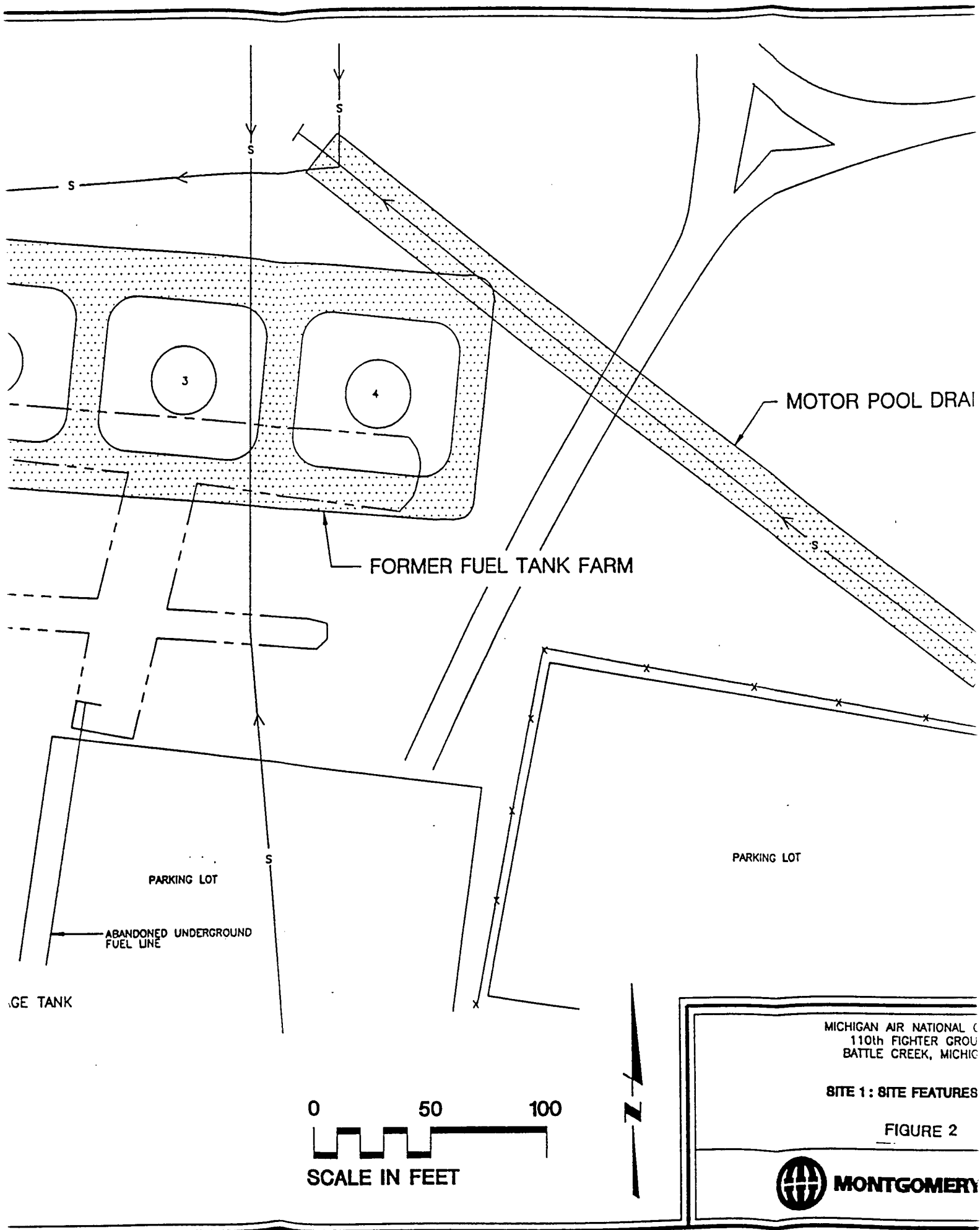


LEGEND

- | | | | |
|-----------|----------------------------|-----|---|
| — S — | STORM DRAINS | ○ 1 | ABOVEGROUND STORAGE TANK (PRE-EXISTING) |
| — X — X — | FENCE | == | ROADS |
| - - - - | EXCAVATED IN 1992 | | |
| ➔ | GROUNDWATER FLOW DIRECTION | | |

NOTES:

THE SURFACE ELEVATION OF SITE 1 IS APPROXIMATELY 920 FT MSL \pm 5 FT (THE EARTH TECHNOLOGY CORPORATION, JUNE 1995)



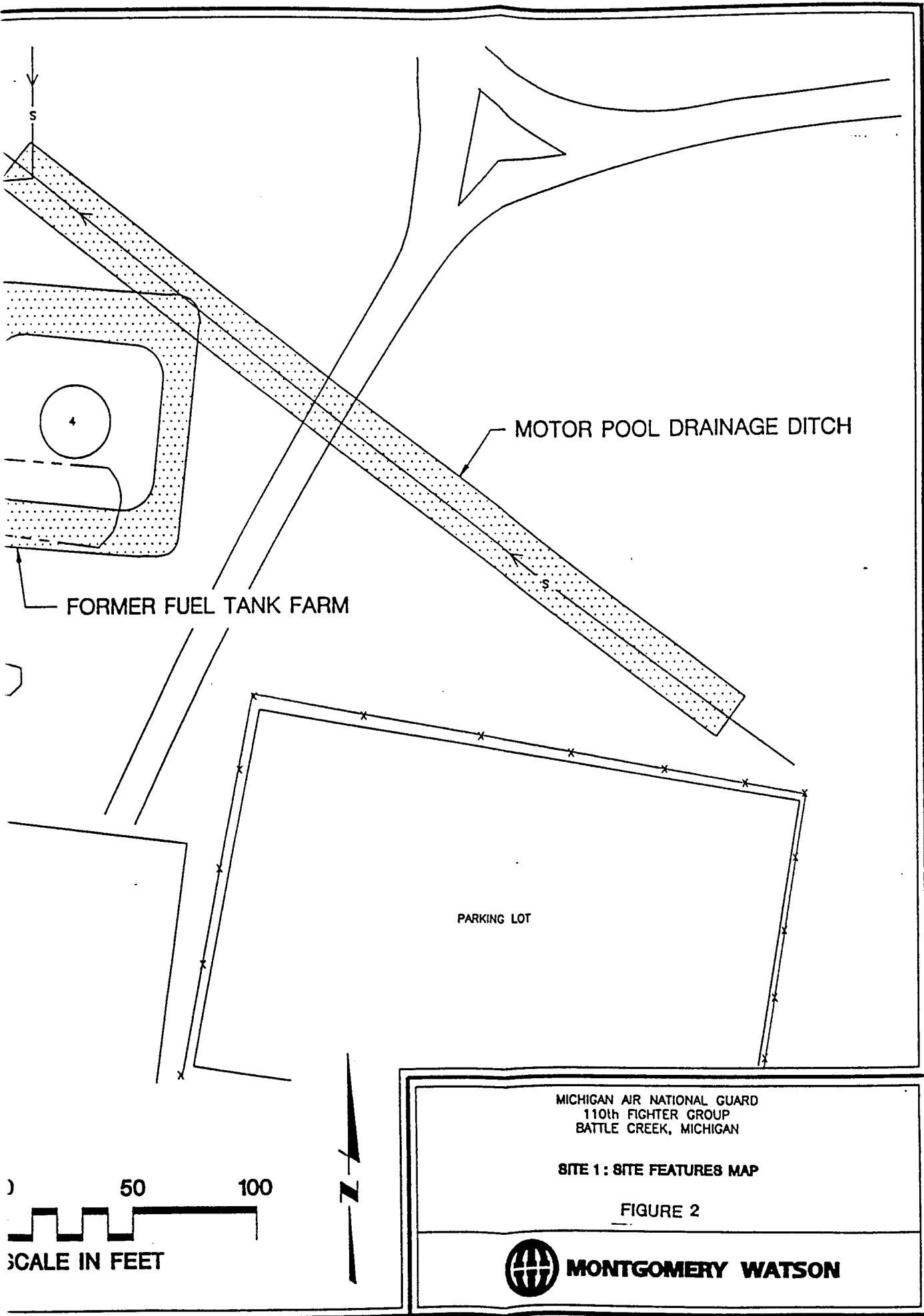
MICHIGAN AIR NATIONAL C
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SITE 1: 8TH SITE FEATURES

FIGURE 2



MONTGOMERY



MICHIGAN AIR NATIONAL GUARD
110th FIGHTER GROUP
BATTLE CREEK, MICHIGAN

SITE 1: SITE FEATURES MAP

FIGURE 2



MONTGOMERY WATSON

3.0 SUMMARY OF SITE ANALYSIS

We conducted an IRP Phase I Preliminary Assessment (PA) at the base in 1987 to identify and assess past operations at the base that may have involved storage, disposal, or spills of hazardous materials or wastes (Hazardous Materials Technical Center, 1987). Site 1 was identified during the PA.

During the site investigation (SI) in 1988, we completed soil sampling at Site 1. Sampling results were not useable due to poor data quality and lack of laboratory quality assurance/quality control procedures (Engineering-Science, 1993). Although soil contamination at the site was not quantified, the data did indicate the presence of petroleum products in the soil.

In 1993, we identified an additional area of concern (formerly referred to as Area of Concern B) during a supplemental base-wide PA investigation. Due to the overlapping areas, Area of Concern B was combined with Site 1 (Figure 1).

We collected and analyzed surface and subsurface soils in the vicinity of the motor pool drainage ditch in 1994. The PA/SI Report (The Earth Technology Corporation, 1995) provides details on the field activities including the depth of each sample, the constituent concentrations, the depth of the contamination, and the methods used in collecting and analyzing the samples.

In 1995, we completed remedial investigation (RI) activities for Site 1. This included collection and analysis of thirty-three surface and subsurface soil samples from twenty-two soil borings for volatile organic constituents (VOCs), semi-volatile organic constituents (SVOCs), and lead. In addition, we collected twenty-one groundwater samples from two existing wells and 13 GeoprobeTM locations and analyzed the samples for VOCs. We also collected four groundwater samples from existing wells and analyzed the samples for VOCs, SVOCs, and Priority Pollutant (PP) metals plus barium.

The RI Report (The Earth Technology Corporation, 1995) includes the details of the sampling, including the depth of each sample, the constituent concentrations, the depth of the contamination, and the methods used in collecting and analyzing the samples.

The following sections are a discussion of the chemicals of concern (COCs) identified in the Feasibility Study (FS) for groundwater and soil at Site 1.

3.1 Groundwater

Contaminants in groundwater samples taken from Site 1 were compared with Applicable or Relevant and Appropriate Requirements (ARARs) to identify COCs. ARARs considered in the FS include:

- Generic Industrial Cleanup Criteria for health based drinking water value (Industrial Drinking Water Values) as outlined in the Michigan Environmental Response Act (MERA), Operational Memorandum #14, Revision 2, June, 1995.
- Generic Industrial Groundwater/Surface Water Interface (GSI) as outlined in the MERA, Operational Memorandum #14, Revision 2, June 1995.

The following contaminants were identified as COCs and are considered for remedial actions:

- Arsenic at concentrations exceeding the Industrial Drinking Water Value;
- Phenanthrene at concentrations exceeding the Industrial Drinking Water Value; and
- Tetrachloroethene (PCE) at concentrations exceeding the Industrial Drinking Water Value.

3.2 Soil

Contaminants in soil samples taken from Site 1 were compared with ARARs to identify COCs. ARARs considered in the FS include:

- Generic Industrial Cleanup Criteria for soil direct contact (Industrial Direct Contact Values) as outlined in the MERA, Operational Memorandum #14, Revision 2, June 1995.
- Generic Industrial Cleanup Criteria for soil considered protective of groundwater as outlined in the MERA, Operational Memorandum #14, Revision 2, June 1995.

The following contaminants were identified as COCs and are considered for remedial actions:

- Lead at concentrations exceeding the Industrial Direct Contact Criteria (in sample 1SB12).

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4.0 RISK ASSESSMENT

This section contains a brief summary of the of the risk assessment completed during the development of the RI Report for Site 1. Section 7.2 of the RI Report (The Earth Technology Corporation, 1996) presents the detailed information of the risk assessment including the exposure assessment and the current and future pathways for COCs.

The risk characterization assesses the risks posed to human health by the contaminants in the soil at Site 1. The risk characterization results in the RI Report are based on the assumption that surface soils encompassing the location of 1SB12 will be remediated (since lead contamination at this location is significantly higher than the remaining lead contamination). Assuming remediation of the soil around sample 1SB12, the risk characterization results indicate that none of the complete pathways for contaminants at Site 1 pose a risk greater than 1×10^{-5} , which is the current level determined to be acceptable by the MDEQ. The non-cancer risk index was determined in the risk characterization to be less than 1, indicating a low potential for adverse non-carcinogenic health affects.

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5.0 SELECTION OF REMEDIAL ALTERNATIVE

The FS considered several alternatives for remediation of Site 1. The remedial alternatives analyzed for Site 1 include:

- No Action: The no action alternative serves as a baseline for comparison with other remedial alternatives. Under this alternative, no remedial actions would be completed at Site 1 to contain or reduce the contaminants in the soil and groundwater.
- Limited Action for Soil and Groundwater (Natural Attenuation, Monitoring, and Restrictions): Under the limited action alternative the contaminants in the soil and groundwater would not be contained or treated, but allowed to naturally attenuate. Institutional controls would be used to prevent human exposure to lead in excess of the Industrial Direct Contact Value, and to prevent use of groundwater until it is determined to be protective of human health. This alternative would include a fence around the former location of tank 1 (the location of the lead detection in excess of the Industrial Direct Contact Value). Monitoring the groundwater would allow for an assessment of the natural attenuation to determine when the site no longer poses a threat to human health. It is anticipated that the limited action would require long-term use of institutional controls due to the lead in the surface soil.
- Soil Cap for Soil and Natural Attenuation for Groundwater: This alternative would include the placement of a soil cap over surface soils to prevent human contact with lead contamination in excess of the Industrial Direct Contact Value. The cap would consist of 18 inches of soil which would be seeded with grass. There would be no treatment or containment for groundwater contaminants; instead, the groundwater contaminants would be monitored quarterly, with three rounds per year, for natural attenuation. In addition, this alternative would include institutional controls to prevent human exposure to the soil contamination in excess of the Industrial Direct Contact Value and to prevent use of groundwater until the actions are completed for this alternative. Continued monitoring of

the groundwater would be conducted to assess the natural attenuation of the contaminants, and to determine when contaminants in the groundwater no longer pose a threat to human health. Based on the information presented in the RI Report, leaching of soil contaminants does not appear to be a concern at Site 1. Reviews would be conducted as part of this alternative until monitoring shows that groundwater contaminants have attenuated to below ARARs.

- Soil Cap for Soil and In-situ Groundwater Treatment (Air Sparging): This alternative would include the placement of a soil cap as described for the previous alternative. In addition, this alternative would also include treatment of the groundwater contaminants by air sparging. An air sparge pilot test would be conducted to provide necessary design information. Groundwater will be sampled quarterly, with three sampling rounds per year, throughout the remediation activities to monitor the levels of the groundwater contaminants. The alternative would include institutional controls to prevent human exposure to lead contamination and to prevent the use of groundwater until the remedial actions are completed for this alternative. Based on the information presented in the RI Report, leaching of soil contaminants does not appear to be a concern at this site. A review would be completed as part of this alternative.
- Soil Cap for Soil and Aboveground Groundwater Treatment (Air Stripping and Ion Exchange): This alternative would include the placement of a soil cap as previously described. In addition, this alternative would also include aboveground treatment of the groundwater by adsorption (for organic contaminants) and ion exchange (for inorganic contaminants). A pumping test and bench scale test would be completed to provide necessary design information. Groundwater sampling would be completed quarterly, with three sampling rounds per year, to monitor the groundwater contaminants as the remediation is being completed. This alternative would include institutional controls to prevent human exposure to lead contamination and to prevent use of the groundwater until the remedial actions are completed for this alternative. Based on the information

presented in the RI Report, leaching of soil contaminants does not appear to be a concern at this site. Reviews would be completed until remediation activities are complete.

The proposed/recommended remedial alternative for Site 1 consists of constructing a soil cap over contaminated soil and natural attenuation for contaminated groundwater (the third alternative listed). This alternative will meet the ARARs and remedial actions objectives (RAOs) established in the FS. The soil cap will provide dermal protection from lead contaminated soil. Natural attenuation will effectively decrease levels of the minor contamination in the groundwater. No sources were identified in previous reports for the groundwater contaminants; therefore, it is anticipated that the concentrations of these contaminants will naturally decrease over time and no longer pose a threat to human health or the environment. As the site groundwater is not currently used for a drinking water source (and is not expected to be used as such in the future), natural attenuation is considered appropriate for groundwater contamination at this site.

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6.0 CONCLUSION

Based on the results of the field investigation, we detected three contaminants in the groundwater in excess of Industrial Drinking Water Values. Lead was present in excess of the Industrial Direct Contact Criteria. The remaining contamination at the site was below the ARARs identified in the FS. The soil has been shown to be protective of groundwater since none of the contamination detected in the soil was detected in the groundwater in excess of Industrial Drinking Water Values.

The risk assessment presented in the RI Report identifies no unacceptable risks associated with the contaminants in the soil, assuming that the lead contamination at 1SB12 is remediated to prevent direct contact.

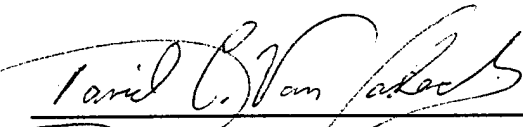
No source of the soil and groundwater contamination was identified during field investigation. The likely source is past operations at the site. This site no longer functions as the fuel storage and handling area, therefore, it is not expected that there will be any additional contamination at the site.

The proposed alternative for Site 1 includes the construction of a soil cap to prevent contact with lead contamination and natural attenuation for the groundwater contamination. This alternative will effectively meet both ARARs and RAOs, including protection of human health and the environment.

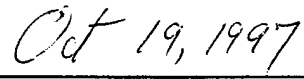
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7.0 DECISION

On the basis of the findings at the MIANG Kellogg Site 1, there is evidence of environmental contamination at the site. The proposed remedial alternative for this site includes the installation of a soil cap and continued groundwater monitoring. A final closure report will be prepared once the groundwater contaminant levels have attenuated to levels that meet the ARARs and RAOs established in the FS. Following the final closure report, this site will be removed from further consideration in the IRP process and no further investigative or remedial activities will be conducted with regard to the site.



Chief, Environmental Division



Date

Michigan Department of Environmental Quality

☐ Concur

☐ Non-Concur (Please provide reason)

Signature

Title

Date

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8.0 REFERENCES

- U.S. Environmental Protection Agency, 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA.*
- The Earth Technology Corporation, 1995. *Internal Draft Remedial Investigation Report, 110th Fighter Group, Michigan Air National Guard, Battle Creek, Michigan.*
- The Earth Technology Corporation, 1995. *Preliminary Assessment/Site Inspection Report, 110th Fighter Group Michigan Air National Guard, W. K. Kellogg Regional Airport, Battle Creek, Michigan.*
- Engineering-Science, 1988. *IRP Draft Immediate Response Report, 110th TASG, Michigan ANG.*
- Engineering-Science, 1992. *Final Site Investigation Report, 110th TASG, Michigan Air National Guard, W. K. Kellogg Regional Airport, Battle Creek, Michigan.*
- Hazardous Materials Technical Center (Dynamic Corporation), 1987. *Installation Restoration Program Phase 1 Records Search: 110th TASG, Michigan Air National Guard, W. K. Kellogg Regional Airport, Battle Creek, Michigan.*
- U. S. Environmental Protection Agency, 1979. *Water-Related Environmental Fate of 129 Priority Pollutants, Volume I, Introduction and Technical Background, Metals, and Inorganics, Pesticides and PCBs.*
- Air Force Center for Environmental Excellence, 1995. *Bio-Venting Study for IRP Site 3 at the W.K. Kellogg Regional Airport, Battle Creek, Michigan.*

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APPENDIX A

LETTER FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

STATE OF MICHIGAN



JOHN ENGLER, Governor
DEPARTMENT OF ENVIRONMENTAL QUALITY

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: www.deq.state.mi.us

RUSSELL J. HARDING, Director

REPLY TO:

ENVIRONMENTAL RESPONSE DIVISION
KNAPPS CENTRE
PO BOX 30426
LANSING MI 48909-7926

September 4, 1997

Mr. Paul Wheeler
ANGRC/CEVR
3500 Fetchet Avenue
Andrews AFB, Maryland 20762-5157

SUBJECT: W.K. Kellogg Air National Guard Base, Calhoun County, Michigan

Dear Mr. Wheeler:

Staff of the Michigan Department of Environmental Quality (MDEQ), have reviewed the proposed remedies for Sites 1 and 3, and Area of Concern B, as presented in the "Further Action Decision Document for Site 1", Draft Final dated July 1996, and the "Further Action Decision Document for Site 3", Draft Final dated July 1996. MDEQ concludes that the proposed remedies will be an integral part of a Final Remedial Action Plan, yet to be submitted, for these sites pursuant to Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Because contamination above applicable generic criteria will be left on the site, final remedial action will need to be either "Limited Industrial Closure," pursuant to Section 20120a(1)(f) to (j), or "Site Specific Closure" pursuant to Section 20120a(2). Section 20120b(3), (4) and (5) of Part 201 lists the legal requirements that must be addressed when a "Limited Industrial Closure" or "Site Specific Closure" applies. While we agree that your proposed remedies are consistent with a Final Remedial Action Plan, the following additional items will need to be addressed to bring these facilities to full lawful closure.

1. Access to media contaminated above generic criteria must be reliably restricted as described in Section 20120b(3)(a). Institutional controls on the property will need to take into account all relevant exposure pathways.
2. The extent of contamination both vertically and horizontally must be adequately defined as per Section 20114(1)(a). Limited additional sampling will be necessary to verify that source area soils and groundwater are adequately remediated and to assure that an adequate characterization of the extent of contamination, left on site, is obtained. Such additional well sampling locations, well screening depths, and sampling parameters, should be proposed in the forthcoming sampling plan and MDEQ should be notified when such additional sampling is scheduled.
3. A property description and survey that defines the areas addressed by the remedial action plan and contaminant boundaries need to be provided as per Section 20120b(4).
4. A long term operation, maintenance and monitoring plan for the site of contamination is necessary pursuant to Section 20120b(3)(b) and (c) to demonstrate that groundwater, in the source area as well as downgradient, does not exceed appropriate standards for a minimum period of one year prior to closure.

September 4, 1997

5. A Legally Enforceable Agreement between the State and the Air National Guard is necessary pursuant to Section 20120b(3).

With regard to the forthcoming sampling proposed for the W.K. Kellogg Air National Guard Base, the Data Quality Objectives and the level of Quality Assurance/Quality Control (QA/QC) must be thoroughly documented and consistent with the purpose of the investigation. As a minimum, Level III Data Quality as described in the USEPA publication, "Data Quality Objectives for Remedial Response Activities" 540/G-87/003, March 1987, must be used. It is also recommended that the constituents of concern be expanded to include all Method 8260 aromatics and solvents. The Quality Assurance Project Plan (QAPP) should include specific information concerning the analytical laboratory and procedures to be used. All laboratory procedures and documentation associated with site samples need to be included in or appended to the QAPP. These procedures include, but are not limited to, analytical methods, sample preparation procedures, initial calibration information, continuing calibration procedures, QC procedures, QC samples, QC limits, procedures for out-of-control situations, method performance, method detection limit determinations, and routine reporting limits.

In addition, we are concerned that there may have been considerable confusion regarding documents subject to review pursuant to Section 20114(8) of Part 201. This confusion occurs because of the cumbersome review and response to comment procedures which result in the submittal of "Draft" documents for comment, and "Draft/Final" documents for comment and "Final" documents for review.

To clarify our position, only documents declared a "Final" by you, and clearly identified in the transmittal letter as a "Final Remedial Action Plan" or "Final Interim Remedial Action Plan", will be reviewed in accordance with 20114(8). Submitted documents will not be subject to the provisions of Section 20114(8) until submitted as "Final". The Environmental Response Division will continue to review and comment on "draft" documents for technical merit, but we do not consider the draft "Interim Remedial Action Plans" currently in house to be subject to the provisions of Section 20114(8). For further clarification, we will not consider any "Draft" documents nor Final Interim Remedial Action Plans to be subject to the provisions of 20118, 20120b or 20120d. We anticipate that these draft interim submittals will be combined into area wide Final Remedial Action Plans and submitted to MDEQ at a later date for review pursuant to Section 20114(8).

We request that you provide this office with your concurrence of the above understanding.

If you have any questions please contact me at 517-241-7706.

Sincerely,



Dan Schultz, Chief
Field Operations Section
Environmental Response Division

cc: Mr. Frederick Vollmerhausen, MANG
Mr. Bob Delaney, DEQ
W.K. Kellogg File - p:\bcm\wkkellog.doc